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not attain to cutting LS produced in the point X, situated without the cavity of the present curve, unless previously the prolonged FT' cuts in some point O the portion of this curve between the points S and K.

Hoc antem erat demonstrandum.

COROLLARY. And hence flows manifestly, that between the tangent of this curve and the curve itself cannot be placed any straight [ray], whether on one or the other side of the tangent, which falls wholly without the cavity of the curve ; since a straight [ray] so located must make (from the preceding) an acute angle with the perpendicular let fall from the point of contact to the opposite base.

[To be Continued.]

DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

102. Proposed by **ALOIS F. KOVARIK, Professor of Mathematics, Decorah Institute, Decorah, Iowa.**

A's age is to B's as 2:3. 20 years from now their ages will be to each other as 4:5. What are their ages, respectively ?

I. Solution by **J. OWEN MAHONEY, B. E., M. Sc., Master of Mathematics and Science, Carthage Graded and High School, Carthage, Texas.**

It is easily seen that A's age : A's age+20 years :: 2 : 4,

or A's age : 20 years :: 2 : 2.

$\therefore$ A's age=20 years. But B's age=$\frac{3}{2}$ of A's=30 years.

II. Solution by **G. B. M. ZERR, A. M., Ph. D., Professor of Mathematics and Science, Chester High School, Chester, Pa.**

In the first instance, A's age=$\frac{2}{3}$ B's age.

In the second instance, A's age=$\frac{4}{5}$ B's age.

$\therefore$ $\frac{2}{3}$ B's age+20 years=$\frac{4}{5}$(B's age+20 years).

$\therefore$ $\frac{2}{15}$ B's age=4 years.

$\therefore$ B's age=30 years, A's age=20 years.

An algebraic solution was furnished by Charles C. Cross.

Solutions of problems 98 and 99 were received from J. K. Ellwood, and solutions of problems 100 and 101 were received from J. Scheffer too late for credit in last issue.

ALGEBRA.

89. Proposed by **G. A. MILLER, Ph. D., Instructor in Mathematics, Cornell University, Ithaca, New York.**

Solve by quadratics, $x^2+y=7$ .... (1),

$x+y^2=11$......(2).